GCSE MARKING SCHEME

JANUARY 2016

APPLICATIONS OF MATHEMATICS
UNIT 1 - FOUNDATION TIER
4361/01

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INTRODUCTION

This marking scheme was used by WJEC for the 2016 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

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GCSE APPLICATIONS OF MATHEMATICS
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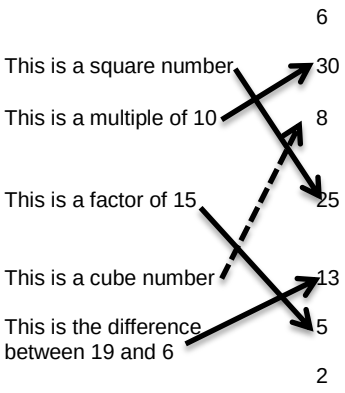
MARK SCHEME – JANUARY 2016

Applications Unit 1 Foundation Tier January 2016		Comments
1. (a) Even chance (b) Unlikely (c) (i) Correct explanation of why Paula is incorrect (ii) 9/10 or equivalent	B1 B1 E1 B1 4	 Eg " there are more letter As, Rs and Ns than the other letters", "because some of the letters are repeated", "Because there are 2 As" etc
2.  	 B3 3	 Award B2 for any 2 or 3 correct. Award B1 for one correct.
3. (a) Evidence of counting squares Answer in range 112 - 116 cm^2	M1 A1 U1 3	 Independent mark
3. (b) Rectangle 11cm by 9cm drawn accurately Circle radius 3.5cm drawn accurately Circle in correct position	B1 B1 B1 3	$\pm$ 2mm $\pm$ 2mm $\pm$ 2mm
3. (c) 4cm and valid explanation given	B2 2	Eg Award B2 for "4cm because the total perimeter of original is 40cm and the perimeter of the new shape is 44cm." OR "The perimeter of the top right hand corner has not changed but the bottom left has increased by 4cm." Award B1 for sight of 40 or 44 OR B1 for 4cm with no explanation OR B1 for statement such as "the top right hand corner has not changed"
3. (d) $1.1 \times 7 \times 6 + 2.2 \times 50$ = (£)156.2(0)	M1 A1 2	
3. (e) For indication to use 3 cm as a side within a net Use overlay Correct net with all 5 additional rectangles correct. 2 rectangles 7 cm × 3 cm 1 rectangle 7 cm × 4 cm 2 rectangles 3 cm × 4 cm	B1 B3 4	May be seen on given diagram or may be implied from their scale drawing. Use overlay ($\pm$ 2mm) Award B2 for 3 or 4 correct rectangles forming part of a correct net OR for all 5 rectangles correct but with an incorrect net. Award B1 for 1 or 2 correct rectangles forming part of a correct net OR for 3 or 4 rectangles correct but with an incorrect net.

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4. (a) Suitable place given with a reason implying access to a number of cars or a number of people.	E1	Eg "at the side of a busy road because there are many different colour cars" OR "in a supermarket because there are lots of people" OR "car company/garage/petrol station as will see cars people own/buy"
(b) No (or not exactly) and reason given	E1	Reason based on when a survey is repeated there will usually be different outcomes eg "different cars could be on the road on another day" OR "different people have different choices" OR "different people asked" OR "no, it might be less busy" OR "different people have different tastes/opinions"
(c) 3 : 2	B1 3	CAO
5. (a) Kim not correct implied or stated with a valid explanation.	E1	Eg "No, as she has rounded down to 170 when for 175.1 she should have rounded up to 180", "no, it should be 180", "no because it's a 5 so needs to be a higher value", "no because it's past half-way so will go higher".
(b) Valid explanation given	E1 2	Eg "because 7431 rounded to the nearest 1000 is 7000", "because this is a good estimate", "it's about 7000", "it's been approximated", "it's been rounded to the nearest 1000".
6. For any 2 correct methods for costing 20 litres For the sight of (£)279.8(0) and (£)199.96 from appropriate working Convincing explanation stated or implied. Look for • spelling • clarity of labels • the use of notation (watch for the use '=' "£" being appropriate) QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar in their answer QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar in their final answer	M2 A2 E1 Q W C 2 7	Award M1for any 1 correct method for costing 20 litres. Award A1 for any 1 correct costing for 20 litres. Eg Karen bought the 5 litre tins AND her friend bought the 1 litre tins *Eg.* *(Cost of 1 litre tins) (20 × (£)13.99 =) (£)279.8(0)* *(Cost of 2.5 litre tins) 8 × (£)29.99 = (£)239.92* *(Cost of 5 litre tins) 4 × (£)49.99 = (£)199.96* QWC2 Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation or grammar OR evident weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar. QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling, punctuation or grammar.

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7. $w = 90 - 67$ $w = 23(^\circ)$ $x = 180 - (90 + 33)$ $x = 57(^\circ)$ $y = 360 - (67 + 145 + 78)$ $y = 70(^\circ)$ $z = (180 - 24) \div 2$ $z = 78(^\circ)$	M1 A1 M1 A1 M1 A1 M1 A1 8	
8. (a) sum of the numbers (= 192) sum ÷ 12 Mean = 16 Put in order 7, 8, 10, 11, 13, 15, 16, 20, 20, 23, 24, 25 Median = 15.5 Mode = 20 Range = 18	M1 M1 A1 M1 A1 B1 B1 7	Attempt to add all given values Divide answer in the range 167-217 CAO Sight of 15 and 16 would gain M1.
8. (b) No, implied or stated, with a reason given (c) (i) Correctly labelled axes Uniform scales used Points plotted correctly Points joined with straight lines (ii) Description of trend given for the whole year.	E1 B1 B1 P1 L1 E1 6	Eg "no, as 20˚C is the temperature on the first day of the month, it could then be hotter". Allow "no, because it could hotter after midday", "no, as 1stday of month not all month", "no, that is just at midday", "doesn't mean it will not get hotter or colder". FT their plotted points. Accept solid or dotted lines Eg "the temperature increases through the year until July and then decreases", "it peaks and then cools down"
9. (a) (i) Centimetres labelled on x-axis AND Inches labelled on y-axis (ii) Answer in range 7.4 – 7.6 cms (b) B	B1 B1 B1 3	 FT from incorrect labels, answer in range 1.1 – 1.3 (cm)

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10(a) Correct scale used with diagonals 6cm and 10cm Longer diagonal split 4 cm and 6 cm at intersection Shorter diagonal split 3 cm and 3 cm Diagonal intersection 90° (±2°) Outline of the kite correct (b) Both obtuse angles AND Head and tail angles correctly measured, ±2°	B1 B1 B1 B1 B1 B2 7	 FT their consistent scale if possible FT their kite for an equal split of the shorter diagonal, a kite must be seen May not be shown, implied provided kite outline seen CAO, not FT *Diagonals given treated as sides, award:* *B1 if scale of sides is correct,* *B0* *B1 if their kite has an equal split of the shorter diagonal,* *B0,* *B0* FT their quadrilateral B1 for any 2 or 3 angles correctly measured, ±2° (Approximately 74°, 53°, 117°, 117°, but measure their angles) There is no requirement for their angle sum to be 360°
11.(a) Perpendicular bisector (±2°) between Shrewsbury and Hereford Aberystwyth and Newtown Helicopter base indicated (b) 62 miles (±5 miles) AND 325 ° (±2°) 70 miles (±5 miles) AND 225 ° (±2°)	 B1 B1 B1 B2 B2 7	 *Arcs must be shown* *Arcs must be shown* Accept sight of the intersections of the perpendicular bisectors FT provided B1 previously awarded and the other perpendicular bisector is within ±4° tolerance *If B0, B0 due to no arcs, allow FT for possible final B1 provided perpendicular bisectors used* Accept the intersection of the two perpendicular bisectors as their indication. FT provided at least one line accurate but the other slightly outside the tolerance, ±4° B1 for each answer B1 for each answer *If neither B1 given for bearings then allow SC1 for bearings meeting ±4° tolerance*
12.(a) 16/40 or equivalent ISW (b) Chicken AND conclusion, e.g. 'Reduce Chicken, yes more money because people will buy more', or 'Chicken, she will not take more as same number of sandwiches might be sold, less takings' (c) 7 : 8 : 5 (d) 7 × 220 ÷ (7+8+5) or 220 × 14/40 or equivalent 77 (salmon sandwiches) (e) Implies first hour and /or Monday morning may not be typical Strategy to improve, e.g. 'need to collect more data', 'need to make the list for more than the first hour'	B2 E1 B2 M1 A1 E1 E1 9	B1 for either 16/ … or …/40 B1 for sight of 14:16:10, sight of 7, 8 and 5 in order FT from their ratio for M1 only Must be the flaw in the current strategy Must be a way to improve the strategy

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